

## **6 Initial experiences of supporting the establishment of community-based and small-scale seed enterprises in Ethiopia**

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### **Introduction**

Chapter 5 presents concepts, approaches and a number of case studies of successful attempts to improve farmers' access to seeds by establishing small-scale and community-based seed enterprises. Chapter 6 narrows the focus and describes the first experiences with this approach in Ethiopia. Section 6.1 concerns the experiences of an FAO seed security project implemented from 2002 to 2007 in Oromia region; sections 6.2 to 6.6 bring together the experiences of five regional teams, from Amhara, Oromia (two teams), SNNPR, and Tigray regions, that were involved in a one-year tailor-made training programme on revitalizing farmer-based seed production and supporting informal seed supply of local crops and varieties in Ethiopia, from October 2006 to October 2007.\* The teams consisted of seed sector professionals from the Ethiopian Seed Enterprise (ESE), the regional Bureaus of Agriculture and Rural Development (BoARDs), the federal and regional Agricultural Research Institutes, and some representatives from the Ministry of Agriculture and Rural Development, the Institute of Biodiversity Conservation, universities, and NGOs. The teams started with a first training workshop on informal seed supply, genetic diversity and the principles of participatory and learning-oriented approaches, and a second workshop on technical and institutional aspects of seed production and marketing, and business approaches supporting informal seed supply. After these trainings, the teams performed a participatory seed system analysis in their respective regions to identify the seed supply problems and define options for supporting informal seed supply. They also conducted a marketing survey to explore the options for developing market-oriented small-scale seed enterprises, and drew up business plans. The seed system analyses and business plans were discussed, shared in the training, and used to design an action plan for the implementation of a community-based or small-scale seed enterprise in each region. Sections 6.2 to 6.6 present the seed supply situation in specific locations in the different regions, the plans for and first results of the establishment of the community-based or small-scale seed enterprise, some results of the first field experience, the constraints and challenges encountered, and opportunities and future prospects.

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\* See Section 1.5 by Marja Thijssen and colleagues on the set-up and lessons learnt of the tailor-made training programme.

## **6.1 Cooperative community-based seed enterprises in Hararghe, Ethiopia: strategy and first lessons learnt\***

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Food security is recognized as one of the main challenges in the drought-prone areas of Eastern Africa where seed insecurity is a major factor contributing to food insecurity. In the drought-prone areas of Ethiopia, seed insecurity contributes a great deal to the inefficiency of the agricultural sector. This section of the current chapter shares the experience of a project that supported the establishment of Cooperative Community-based Seed Enterprises (CCBSE) and the model used for establishing the CCBSEs. It provides the key activities through which the project aimed to support informal seed supply. In conclusion, it shares some lessons learnt on the model, and in particular the need for seed projects and those targeting CCBSEs or similar structures to work through the regional BoARD structure and other regional and local development agencies.

### **Seed security in Hararghe Zone in Eastern Ethiopia**

The seed insecurity situation in the drought-prone areas of Ethiopia in general and Hararghe zone in particular, is created and aggravated by economic as well as environmental factors. The major constraints are lack of infrastructure, lack of improved and adapted varieties and seeds, and lack of services by formal sector agricultural institutions such as research, input suppliers, and extension. Many traditional semi-arid production areas are remote, which causes serious marketing barriers for service providers as well as for markets for farm produce. Recurrent droughts and the need for repeated replanting in the same season have made traditional farmers' seed-saving practice an unreliable source for planting in subsequent seasons. Drought is therefore considered the primary cause of seed insecurity.

Seed insecurity in Hararghe is aggravated by land scarcity, tenure and fragmentation and the nature and diversity of the traditional subsistence farming systems. The situation is further aggravated by successive years of severe drought or erratic rainfall, which require repeated re-planting. Farmers' seed-saving practices have become unreliable, while neither emergency seed supply interventions nor past seed multiplication projects have had a sustainable impact on seed insecurity. The capacity of the informal seed sector to maintain a secure supply of appropriate seeds for the dry land or traditional farming systems areas is inadequate.

Hence, there is a need for a more sustainable seed security system among the food insecure communities in order to strengthen production and/or income

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generation capacity of the farmers. In the absence of seed provision for the drought-prone regions of Ethiopia, the introduction of drought tolerant and/or short-maturing local and improved crop varieties combined with crop diversification and informal on-farm seed multiplication schemes is an attractive and highly justifiable option. In the meantime, there needs to be an emphasis on improvement (pure-line and mass selection) and on-farm seed multiplication of local varieties which are characterized by high adaptation and acceptability. This was the rationale for the implementation of the project entitled '*Strengthening seed supply systems at the local level in Hararghe zones in Eastern Ethiopia*'. With funding from the Norwegian government, the Government of Ethiopia and the FAO implemented the seed security project in the years 2002-2007, working on two main processes. The first of these was crop production improvement through on-farm seed multiplication, production, storage and marketing of seeds of improved and local farmers' cultivars of selected food crops. And the second one was promotion of crop diversification through demonstration plots and the production of seeds of cash crops that could increase the farmers, income. This section focuses on the support to the establishment of community-based seed enterprises.

### **The strategy for the establishment of community-based seed enterprises**

A systematic approach is critical in the assessment, planning and development of CCBSEs. The approach used included the following steps:

1. Informal discussion with officials at the regional, zonal and woreda levels about the CCBSEs, for awareness creation and development of criteria for a structured survey to identify potential zones and woredas. In general, criteria include location accessibility, resources, crop rotation, level of seed awareness, availability of land, potential for irrigation, functional community organization, seed market and the capacity of the Office of Woreda Agriculture and Rural Development to assume leadership.
2. Training of extension staff to conduct the survey to select zones and woredas within them, based on the criteria set during step 1 above.
3. Informal discussions with selected communities on establishing CCBSEs, to explain the model and take note of farmers' concerns. In general, criteria for community level surveys are the same as shown in step 1 above, but with more details on each criterion.
4. Training of community development agents to conduct the survey to select the appropriate communities and sites and functional community organization, based on criteria developed in step 3 above.
5. Conducting the base line survey, analysing the results and selecting appropriate communities and sites for establishing the CCBSE unit.
6. Training and orientation for the selected zones, woreda staff and community groups on group formation and the project strategies for on-farm seed multiplication and marketing.
7. Establishment of the CCBSE as a legal entity based on a signed agreement between the CCBSE and Agriculture and Rural Development Office of the woreda concerned.

8. Identification and provision of critical seed supplies and equipment on a credit basis with easy repayment arrangements.
9. Establishment of community seed stores.
10. Implementation of seed production and establishment of a revolving fund.
11. Conducting a capacity building program, including training, extension and field demonstration, professional workshops, study tours, etc.
12. Linking the CCBSE unit with key stakeholders including research institutes, and formal and informal seed supply systems.
13. Linking the CCBSEs with markets.

### **The model of community-based seed enterprises**

The model for the organization of CCBSE is simple and self-contained; the focus is on the establishment of a cooperative at community level. An adequate knowledge of farmers' organizations is required for the design. Given this, access to appropriate technologies and facilities will enable the cooperative to plan and handle the seed production operations from planting to cleaning, marketing and distribution. Based on these components, the CCBSE model was designed in the project, and a process involving three guiding topics was used for its implementation. The topics are the following: (i) community organization and technical, operational and administrative establishment of the enterprise; (ii) the development and dissemination of appropriate varieties, seeds and technologies; and (iii) crop biodiversity maintenance and on-farm conservation.

#### *Support in the establishment of the enterprise*

The organization and establishment of a CCBSE unit, includes the set-up of a cooperative organization, establishment of seed cleaning facilities, strengthening of seed storage capacities, and selling points. In addition, contractual arrangements between the CCBSE and individual farmers in the community need to be fostered. The CCBSE unit is community-based, owned and managed; it plays a major role in leading and running all the CCBSE activities. Planning and execution is in the hands of the community organization, with initial managerial and technical, support, guidance and supervision provided by the woreda's extension agents and experts.

Simple, practical and affordable local technologies, inputs and procedures are used within the CCBSE operations for seed production, quality control, and post harvest cleaning, packaging and storage. The farmers concerned play the major role of establishing the enterprise seed facilities and assets, by contributing all required agricultural land, labour, and locally available construction materials. Each CCBSE starts with the establishment of a more than five hectare cooperative-owned seed farm. The project provides capacity building and technical support, supervision and guidance in terms of training, field operations follow-up and backstopping. In addition, the project furnishes the CCBSE with initial seeds, other agriculture inputs and critical items for seed cleaning and the construction and management of simple seed stores.

The project sees contractual seed production as the most important activity. The CCBSEs advertised an agreement for contractual seed multiplication by interested

seed growers in the community. The agreement places particular emphasis on the major cereal food crops (maize, sorghum and wheat) and selected cash crops (potato, onion and haricot beans). Standard field cultural practices for seed crop establishment and quality control practices were performed under the direct supervision and technical guidance provided by the project field staff and the woreda development agents and experts.

In the course of project implementation (2002-2007), four CCBSE units have been established, and four are currently under establishment. Profile information on the project CCBSE units established in East Hararghe, and those under establishment in West Hararghe and East Shoa, is summarized in Table 6.1, including the location, human resources, crops, facilities and the major constraints.

#### *Seed production*

Table 6.2 shows the CCBSEs' seed production data, including the amounts of seed delivered, areas planted and estimates of total seed production over the period 2003 to 2007. Initially the activities of the CCBSEs were limited to the multiplication/demonstration plots of selected crop varieties at the CCBSE seed farms. This is because of the following reasons: (i) a severe scarcity and shortage of initial seeds (pre-basic and basic seeds), (ii) the emphasis given to seed quality and demonstration of the standard practices for quality seed production, and (iii) the need for familiarizing the members with the concept, arrangements and agreements of the CCBSE contractual seed multiplication scheme. Some of the data on total seed production in Table 6.2 are based on estimates. Actual yields are difficult to obtain due to several factors: (i) the tendency of the seed growers not to abide by the terms of the contractual agreement, e.g. demanding higher prices than initially agreed upon, and giving priority to the distribution of the produced seed to relatives, friends and neighbours in the community, (ii) the need to reject a number of contractual seed fields because of poor seed quality, (iii) insistence of the CCBSEs on involving all their members as contractual growers, often resulting in poor follow-up on the seed production, quality control and final collection, (iv) The CCBSE units' initial lack of financial capital to purchase all the seeds produced on a contractual basis, (v) the priority given to the collection of seed of improved crop varieties, primarily of cash crops such as potatoes and legumes, which have superior market value and generate better income, (vi) poor follow-up by woreda field staff coupled with the CCBSE members' initially limited experience of contractual seed production planning and management. However, during the past two years the situation has improved, with the CCBSEs becoming more organized and accustomed to the seed production management, particularly in the new expansion areas in East Shoa zone.

**Table 6.1** Profiles of cooperative community-based seed enterprises in East Hararghe (2003 – 2006/7), West Hararghe and East Shoa (2006/7) Zones

|                                  | <i>J. Gemechu</i> | <i>H. Gudina</i> | <i>J. Belina</i> | <i>B. Jallalla</i> | <i>Wonagle</i>          |
|----------------------------------|-------------------|------------------|------------------|--------------------|-------------------------|
| <i>Basic general data</i>        |                   |                  |                  |                    |                         |
| Foundation                       | Nov. 2003         | Feb. 2003        | June 2004        | June 2004          | March 2005              |
| PA                               | Emerosodu         | Ifa-jallalla     | J. Belina        | Fughan Bira        | Wonagle                 |
| Woreda                           | Kerssa            | Kerssa           | Kurfachelle      | Gursum             | Gursum                  |
| Proximity to woreda main town    | 3 km              | 18 km            | 2 km             | 18 km              | 15 km                   |
| Accessibility to zonal main town | 41 km             | 58 km            | 57 km            | 93 km              | 80 km                   |
| Road condition                   | Good              | Good             | Good             | Fair               | Fair                    |
| Population PA                    | -                 | 3,423            | 6,895            | 2,985              | -                       |
| Population woreda                | 142,505           | 142,505          | 45,417           | 149,889            | -                       |
| <i>Human resources</i>           |                   |                  |                  |                    |                         |
| WARDO experts                    | 14                | 14               | 13               | 11                 | 11                      |
| WRDO Das                         | 16                | 16               | 19               | 13                 | 13                      |
| CCBSE members                    | 41                | 211              | 300              | 68                 | 68                      |
| Members > 4 <sup>th</sup> grade  | 1                 | 4                | 2                | 2                  | 2                       |
| <i>Crops and facilities</i>      |                   |                  |                  |                    |                         |
| Major crops                      | Maize, potatoes   | Maize, potatoes  | Wheat, potatoes  | Wheat, potatoes    | Sorghum, maize, legumes |
| Communal seed farm               | > 5 ha            | > 8 ha           | 3.5 ha           | 3.0 ha             | > 10 ha                 |
| Irrigation                       | Pump              | Pump             | Pump             | Gravity            | Pump                    |
| Seedling nursery                 | Yes               | Yes              | Yes              | -                  | -                       |
| Processing equipment             | -                 | Seed cleaner     | Seed cleaner     | -                  | Seed cleaner            |
| Packaging & labelling            | Weigh scale       | Weigh scale      | Weigh scale      | Weigh scale        | Weigh scale             |
| Seed storage                     | -                 | Seed store       | Seed store       | Seed store         | Seed store              |
| Village seed shop                | -                 | Yes              | -                | Yes                | -                       |
| Power source                     | -                 | Generator        | Generator        | -                  | Generator               |
| <i>Constraints*</i>              |                   |                  |                  |                    |                         |
| Enforcement of agreements        | 4                 | 5                | 5                | 0                  | 0                       |
| Membership size                  | 5                 | 0                | 0                | 0                  | 0                       |
| CCBSE leadership                 | 2                 | 5                | 5                | 4                  | 2                       |
| Cooperative organization         | 2                 | 3                | 3                | 0                  | 5                       |
| Dependency syndrome              | 3                 | 5                | 5                | 3                  | 3                       |
| Contractual seed production      | 3                 | 3                | 3                | 4                  | 3                       |
| Communal land                    | 0                 | 0                | 0                | 5                  | 3                       |
| WARDO technical support          | 4                 | 4                | 4                | 3                  | 4                       |
| Market orientation               | 0                 | 1                | 2                | 3                  | 0                       |

**Table 6.1** Continued

|                                       | <i>Hargei</i>           | <i>Bibilo</i>           | <i>Biftu</i>            | <i>B. Hawai</i>         |
|---------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| <i>Basic general data</i>             |                         |                         |                         |                         |
| Foundation PA                         | 2006/07                 | 2006/07                 | 2006/07                 | 2006/07                 |
| Woreda                                | Mieu                    | Mies                    | Lummee                  | Gimbichu                |
| Proximity to woreda main town (km)    | 25                      | 13                      | 5                       | 2                       |
| Accessibility to zonal main town (km) | 50                      | 38                      | 60                      | 90                      |
| Road condition                        | Seasonal                | Seasonal                | Good                    | Good                    |
| Population PA                         |                         |                         |                         |                         |
| Population woreda                     |                         |                         |                         |                         |
| <i>Human resources</i>                |                         |                         |                         |                         |
| WARDO experts                         | 13                      | 13                      | 11                      | 12                      |
| WRDO Das                              | 23                      | 23                      | 26                      | 31                      |
| CCBSE members                         | 45                      | 55                      | 150                     | 210                     |
| Members > 4 <sup>th</sup> grade       | 2                       | 1                       | > 10                    | > 10                    |
| <i>Crops and facilities</i>           |                         |                         |                         |                         |
| Major crops                           | Sorghum, maize, legumes | Sorghum, maize, legumes | Lentil, wheat, chickpea | Lentil, wheat, chickpea |
| Communal seed farm                    | > 15 ha                 | > 15 ha                 | 5 ha                    | 2.5 ha                  |
| Irrigation                            | Gravity                 | Gravity                 | -                       | -                       |
| Seedling nursery                      | -                       | -                       | -                       | -                       |
| Processing equipment                  | Under duplication       | Under duplication       | Under duplication       | Under duplication       |
| Packaging & labelling                 | Under procurement       | Under procurement       | Under procurement       | Under procurement       |
| Seed storage                          | Under construction      | Under construction      | Under construction      | Under construction      |
| Village seed shop                     | Under construction      | Under construction      | Under construction      | Under construction      |
| Power source                          | To be determined        | To be determined        | To be determined        | To be determined        |
| <i>Constraints*</i>                   |                         |                         |                         |                         |
| Enforcement of agreements             | 3                       | 3                       | 0                       | 0                       |
| Membership size                       | 0                       | 0                       | 0                       | 0                       |
| CCBSE leadership                      | 2                       | 2                       | 0                       | 0                       |
| Cooperative organization              | 3                       | 3                       | 1                       | 1                       |
| Dependency syndrome                   | 3                       | 3                       | 0                       | 0                       |
| Contractual seed production           | 1                       | 1                       | 1                       | 1                       |
| Communal land                         | 0                       | 0                       | 3                       | 3                       |
| WARDO technical support               | 4                       | 4                       | 3                       | 3                       |
| Market orientation                    | 2                       | 2                       | 0                       | 0                       |

Note: \* Magnitude of constraints from 0 (absent), 1 (low) to 5 (high).

**Table 6.2** Seed production (in quintals) of the cooperative community-based seed enterprises in East Hararghe (2003 – 2006/7), West Hararghe and East Shoa (2006/7) Zones

|                             | <i>Crops</i> |              |                |             |                           |               |
|-----------------------------|--------------|--------------|----------------|-------------|---------------------------|---------------|
|                             | <i>Maize</i> | <i>Wheat</i> | <i>Sorghum</i> | <i>Teff</i> | <i>Pulses<sup>1</sup></i> | <i>Potato</i> |
| <i>Eastern Hararghe</i>     |              |              |                |             |                           |               |
| J. Gemechu                  | 107.4        | 239.8        | 309.6          |             | 128.2                     | 123.4         |
| H. Gudina                   | 37.5         | 131.5        | 501.0          |             | 161.0                     | 237.0         |
| J. Belina                   | 1200.0       | 152.0        |                |             | 97.5                      | 2.5           |
| B. Jalala                   |              | 105.0        |                |             |                           | 245.0         |
| Wonagle                     | 960.0        |              | 5,190.0        |             | 197.0                     |               |
| <i>West Hararghe</i>        |              |              |                |             |                           |               |
| Hargeti <sup>2</sup>        | Na           |              | Na             |             |                           |               |
| Bilibo <sup>2</sup>         | Na           |              |                |             |                           |               |
| Others (06/07) <sup>3</sup> | 1262.5       | 627.5        | 246.0          | 251.0       | 28.0                      |               |
| <i>Eastern Shoa</i>         |              |              |                |             |                           |               |
| Biftu                       |              | 2,188.3      |                |             | 410.0                     |               |
| B. Hawaii                   |              | 1,662.5      |                |             | 346.0                     |               |
| Grand total                 | 3567.4       | 5106.6       | 6246.6         | 251.0       | 1367.7                    | 607.9         |

Notes: <sup>1</sup> Pulses = chick pea, haricot bean, lentil; <sup>2</sup> Seeds provided for planting, but no data available yet; <sup>3</sup> Contracted seed growers at Koni, Dar Labu, Tulu and other locations.

#### *Seed multiplication and varietal demonstration plots*

Varietal seed multiplication/demonstration plots were established, in cooperation with national technology generation and transfer institutes, to enable participating CCBSEs to have access to improved varieties and other seed production technologies. The plots were useful for the selection of improved varieties and indigenous germplasm accessions of food and cash crops. The trials were setup for testing maize, wheat, haricot bean, potato, chickpea and onions varieties and accessions. To demonstrate and promote crop diversification of export cash crops, seedling nurseries for vegetable and other horticultural and forest crops were established at each CCBSE seed farm to provide planting material (seedlings) for orchards and gardens. Seeds of potential export vegetables, including carrot, onion, Swiss chard, egg plant, cabbage, tomato, cauliflower, beet root, leek and lettuce, were distributed for plantation and demonstration purposes. The numbers of crop/variety seed multiplication/demonstration plots established in the project's three zones are presented in Table 6.3.

#### *Crop biodiversity maintenance and on-farm conservation*

On-farm conservation and maintenance of indigenous crops and local varieties is essential for stabilizing and improving crop productivity. It represents a mechanism for coping with the risk of drought-induced crop failure and eventual seed insecurity. The project model therefore emphasizes on-farm conservation of crop biodiversity, through on-farm multiplication of local varieties. In collaboration with the Institute of Biodiversity Conservation (IBC), the project

**Table 6.3** Number of varietal seed multiplication/ demonstration plots established by cooperative community-based seed enterprises in East and West Hararghe and East Shoa Zones (2003-2007)

| <i>Crop</i>       | 2003 | 2004 | 2005 | 2006 | 2007 | Total | Source  |
|-------------------|------|------|------|------|------|-------|---------|
| <i>Cereals</i>    |      |      |      |      |      |       |         |
| Wheat             | 7    | 14   |      | 3    | 7    | 31    | KRC     |
| Wheat (Acc.)*     | 44   |      |      |      |      | 44    | IBC     |
| Durum wheat       |      |      |      |      | 2    | 2     | DRC     |
| Maize             | 13   | 17   |      | 3    |      | 33    | MRC     |
| Maize (Acc.)      | 8    |      |      |      |      | 8     | IBC     |
| Sorghum           | 11   | 14   |      | 9    |      | 34    | MRC, AU |
| Sorghum (Acc.)*   | 48   |      |      |      |      | 48    | IBC     |
| Teff              |      |      |      | 5    | 4    | 9     | DRC     |
| Barley            |      |      |      | 2    |      | 2     | KRC AU  |
| Barley (Acc.)*    | 10   |      |      |      |      | 10    | IBC     |
| <i>Legumes</i>    |      |      |      |      |      |       |         |
| Haricot           | 6    | 19   |      | 12   |      | 37    | MRC,HRC |
| Haricot (Acc.)*   | 9    |      |      |      |      | 9     | IBC     |
| Lentil            |      |      |      | 4    |      | 4     | DRC     |
| Chick pea         | 3    | 1    |      | 4    |      | 8     | DRC     |
| Faba bean         |      |      |      | 3    | 4    | 7     | KRC,HRC |
| Faba bean (Acc.)* | 2    |      |      |      |      | 02    | IBC     |
| Field pea         |      |      |      | 2    | 4    | 6     | KRC,HRC |
| Field pea (Acc.)* | 8    |      |      |      |      | 8     | IBC     |
| Fenugreek (Acc.)* | 22   |      |      |      |      | 22    | IBC     |
| <i>Vegetables</i> |      |      |      |      |      |       |         |
| Potatoes          | 4    | 14   |      |      | 6    | 24    | AU, HRC |
| Onion             | 1    | 4    |      |      |      | 5     | MWRC    |
| Others            |      | 6    |      |      |      | 6     |         |
| <i>Oil crops</i>  |      |      |      |      |      |       |         |
| Sesame            | 4    | 15   |      |      |      | 19    | MWRC    |
| Sesame (Acc.)*    | 6    |      |      |      |      | 6     | IBC     |
| Groundnut         | 6    | 15   |      |      | 4    | 25    | MWRC    |
| Groundnut (Acc.)* | 1    |      |      |      |      | 1     | IBC     |
| Sunflower (Acc.)  | 4    |      |      |      |      | 4     | IBC     |
| Total             | 217  | 119  |      | 47   | 31   | 414   |         |

\* Accession of mostly indigenous germplasm; KRC = Kulumsa Research Center; IBC = Institute for Biodiversity Conservation; DRC = Debre Zeit Research Center; MRC = Melkassa Research Center; HRC = Holeta Research Center; AU = Alemaya University; MWRC = Melka Were Research Center.

conducted the collection, purification, documentation, multiplication, and dissemination to farmers of local varieties\*. In cooperation with the IBC, 161 germplasm accessions were reintroduced that were originally grown in Kersa and other neighbouring woredas. The reintroductions included the crops sorghum (48 accessions), maize (8), wheat (44), barley (10), fenugreek (22), haricot beans (9), field

\* In Section 3.4, Girma Balcha and Tesema Tanto go into more detail about this approach linking conservation of local crops and varieties and supporting informal seed supply in Ethiopia.

pea (8) beans (2), sesame (6) and sunflower (4). The accessions were included in a demonstration plot for farmer observation at the Haqina Gudina CCBSE seed farm in the 2003/4 cropping season. The reintroduced local varieties were also used for participatory varietal selection, multiplication and utilization.

### **Lessons learnt and options for application of the model in other regions**

A model for establishing CCBSEs was tested and refined on the basis of the experience of the project. The project-established CCBSE units are community-based, community owned and managed schemes for seed multiplication; they promote crop diversification and on-farm conservation of biodiversity, and use of local resources and simple affordable technologies. Eight CCBSE units have been established in three woredas in East Hararghe (4), one woreda in West Hararghe (2) and two woredas in East Shoa (2). In their short existence, these CCBSE units have demonstrated that the seed security of the rural communities can be increased. Other activities of the seed security project also contributed to increasing crop productivity, diversification and seed development. The project model was noted to have been widely accepted among rural communities, and good progress has been made on the institutional side at the community level. This confirms the community's need for and appreciation of the service delivered by the CCBSE unit. The lesson learned from the above is that it is possible to establish CCBSEs with the full participation and ownership of the community.

CCBSE communities should have a strong history of working together in community activities. One community (Namely Wanagli CCBSE) came to the project to request assistance, and ended up being one of the most successful because of strong community leadership and cohesion.

Precise data on seed production and marketing are difficult to gather through the extension staff. Much of the seed produced was marketed directly in the community.

Analysis of major differences between different woredas and agro-ecological zones in respect to establishment of CCBSE indicated that the poorer and more drought-prone zones were less likely to establish viable CCBSEs. This was attributed to several factors, including the erratic nature of the rainfall, poor access to markets, and the lack of cash crops.

A key lesson learnt from the project in Hararghe is that the structures for supporting CCBSEs should be properly embedded in the systems of the relevant stakeholders, particularly those of BoARDs, the Cooperative Commission, the formal seed system (EARO, ESE and the universities), and components of the informal seed system. CCBSEs and any project supporting their development should maintain vital linkages or be integrated within the formal and informal seed system. Institutional sustainability at all levels is of vital importance for the project's future impact and upscaling. For building such institutional sustainability, the following factors must be considered:

- It is essential that there is substantial ownership, leadership and follow-up from the agriculture and rural development bureaus and offices at regional, zonal and woreda levels, particularly in respect to provision of technical support and

guidance in all seed production operations and practices from field selection through seed production and marketing.

- Integration of the project into relevant government and other key stakeholder institutions' structures is critical for securing institutional sustainability for successful implementation and future upscaling and expansion of the project in new seed-insecure areas.
- Agreements should be established that organize and govern community participation and commitment.
- There should be clarity on the concept of business and market orientation and that the CCBSE is a private community-based, owned and managed business.
- The CCBSE needs linkages with the formal and informal seed production systems including, research, extension, cooperatives and credit and marketing systems.
- It is important to build the farmers' capacity for organizing, leading and managing seed-related agro-business activities, particularly the entrepreneurial skills of CCBSE members.
- The task of building and maintaining sustainability at the community level is made difficult by the prevalent dependency syndrome created by repeated food, seeds and other relief interventions. This situation requires cautious, diplomatic, but firm handling to lead the local communities from a relief orientation to a development/business one.
- Simple and affordable local rural technology and inputs should be used as much as possible.
- For the model to be expanded to other areas, it should be reoriented so that the government has a central role in facilitating the establishment of institutional sustainability, and relevant national authorities play a larger role in the project ownership, leadership, planning and management.

Effective integration of any such project should be guided within the BoARD under the regional government and the respective offices at zonal, woreda and PA levels. The woreda BoARD offices should be front line implementers. The Development Agents (DAs) in each woreda should be the main development actors working within a community at peasant association level. The Regional Cooperative Promotion Commission (CPC), should be actively involved through its experts at various levels, and should be responsible for issues related to organizing production cooperatives, group formation, marketing of seeds, credit, and training and capacity building of beneficiaries, in respect to developing and strengthening their business and entrepreneurial skills.

The practical experience and confidence gained over five years helps to motivate other organizations supporting the development of small-scale and community-based seed enterprises in Ethiopia and other sub-Saharan countries. The progress made is appreciated by all the parties involved, including the donors, implementing partners, stakeholders and, most importantly, the beneficiary farming communities.

Seed quality standards and certification should be part of the project, but this component needs more attention so that farmers will have confidence in certified

seed. It is expected that acceptance of seed quality standards will eventually develop along with knowledge about seeds, experience of seed production, and the competition between the CCBSE units and other seed suppliers. Meanwhile, the FAO 'Quality Declared Seed Standards' offer a reasonable option for dealing with seed quality standards in the context of informal on-farm seed multiplication. These standards should be adopted in the national seed policy, to promote informal seed multiplication.

These lessons learnt suggest that, to develop institutionally sustainable CCBSE units, it will be necessary to adopt a business model,\* and to transfer business skills to the units and help them to develop the marketing structures required for success. Through studies aimed at understanding market parameters such as demand forecast, product promotion to boost demand, demonstrations and trials, to strengthen the basis for the seed replacement efforts, and linkages to potential consumers and market facilitators. For the CCBSEs to become economically viable organizations, they need to develop into profitable and effective business entities able to offer the required services to the target rural communities, and adequate returns to their owners.

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## **6.2 Avola Goshiye Community-based Seed Enterprise in Yilmana Densa woreda, Amhara region<sup>†</sup>**

*Amelework Beyene, Alem Yalew, Abebew Assefa and Yimam Tessema*

The Amhara National Regional State (ANRS) occupies most of the north-western and north-eastern parts of Ethiopia. Agriculture is the mainstay of economy, and about 88% of the population depend on agriculture for their livelihoods. Animal husbandry and crop production are the two main agricultural activities, and crops include cereals, pulses, oil crops, fibre crops, fruits and vegetables. A high population growth rate of 2.9% p.a. has a big impact on the growth of the sector, creating fragmented land holdings and adversely affected land management by causing erosion and making soil and water conservation difficult.

Low productivity coupled with depletion of the natural resource base has made agriculture a risky business. This challenge calls for immediate intervention in research and development. Generation of economically feasible, socially acceptable and

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\* In Section 5.2, Antony van Gastel, Zewdie Bishaw and Bill Gregg give an overview of the business principles to be embraced for the establishment of institutionally and economically viable small-scale seed enterprises.

† This section is an output of the Amhara regional team participating in the ESE/WUR/ICARDA Tailor Made Training Programme on Revitalizing the farmer based seed production and supporting informal seed supply of local crops in Ethiopia, supported by Nuffic (The Netherlands).

environmentally friendly agricultural technologies is vital to increase production and productivity per unit area of land. Although one can not deny that the technologies at hand are not adopted by farmers, they are also not properly popularized and seed is not available to the farmers.

### **The seed supply situation in Amhara region**

In Amhara region, the use of improved technologies such as agro-chemicals, improved seed and farm equipment is in its infancy. Currently, the formal sector is not in a position to meet the seed demand of the region, where the informal sector accounts for 88% through local seed exchange. Seed of local varieties can be obtained through purchase, gift or exchange. Seed of improved varieties can be purchased from agricultural research, the Ethiopian Seed Enterprise (ESE) or the Bureau of Agriculture and Rural Development (BoARD). More recently, some private investors have got involved in seed production and marketing. However, due to the vast area, the formal system is unable to satisfy the seed demand of the region. As a result, farmers remain associated with locally produced seed and their local varieties. A possible option for overcoming this constraint is to mobilize farmers to produce quality seed. One of the ways to do this is to organize seed grower cooperatives or develop community-based seed enterprises.

The new economic policy of the country, Agricultural Development-Led Industrialization (ADLI), has clearly identified poverty, land degradation and low agricultural productivity as the main challenges. Poverty reduction largely depends on how land and other resources are utilized. By implication, ADLI favours agriculture and agricultural research and development activities. It will therefore provide a great opportunity to support seed grower cooperatives and community-based seed enterprises. Seed experts representing the Amhara BoARD, the Amhara Regional Agricultural Research Institute and the Ethiopian Seed Enterprise participated in a tailor-made training programme supporting informal seed supply. Upon initial training, the Amhara team conducted a participatory seed system analysis and a seed demand survey in Yilmana Densa woreda. This section focuses on the outcome of the participatory seed system analysis as conducted in November – December 2006, which forms a basis for the establishment of a community-based seed enterprise (CBSE) in Yilmana Densa woreda, west Gojjam zone, Amhara region located 43 km southeast of Bahir Dar along the road to Addis Ababa.

### **Overview of the enterprise**

The objectives of the enterprise are to (i) empower farmers to produce quality seed; (ii) assure sustainable and quality seed supply in the area; (iii) improve the livelihood of farmers by generating income from seed sales; and (iv) create job opportunities for farmers of the area. The CBSE is located in Goshiye Kebele of Yelimana Densa woreda in West Gojjam Zone. The enterprise is named Avola Goshiye Community-based Seed Enterprise, after a famous hill nearby Adet town and the kebele. From four surveyed kebeles, Goshiye is selected because of the availability of irrigation facilities. There are over 400 ha of irrigated land. Farmers were already involved in seed production in collaboration with Adet Research Centre, and are especially

experienced in potato seed production. A total of 15 ha of land is required, of which 10 ha for hybrid maize and 5 ha for potato. From our survey, the average landholding is 0.25 ha; about 60 farmers will therefore participate in seed production.

#### **Legal form and structure of the enterprise**

A cooperative-based seed enterprise is suggested because there are strong and active cooperatives in all the surveyed areas. The cooperatives have active members, as well as offices, stores, and other facilities. Additionally, they are engaged in agricultural input supply and other off-farm activities. They purchase grain during peak production time and sell it when the price is higher. The cooperatives are an ideal basis for a strong seed business. However, due to previous bad experience with cooperatives, farmers are reluctant to join already existing cooperatives. Discussion with farmers revealed that this is a very sensitive issue. The team suggested that farmers should solve their problems by themselves without much external interference. A committee of four farmers' representatives was established to resolve the problem with the assistance of a cooperative agency representative and the development agent. The committee has the mandate to discuss the pros and cons of each organizational form thoroughly and choose the best one for a sustainable community-based seed enterprise in their particular context.

#### **Products, crops and varieties**

Crop and variety choice is based on market demand, productivity, and suitability for different end uses, as well as suitability of the area for specific crops. Teff, wheat, maize and potato are dominant crops. However, wheat and teff are not profitable for the seed business. Since a seed production scheme is planned using irrigation, it is not worthwhile to produce low market value crops. Therefore, potato and hybrid maize were selected; these crops have high market demand and attractive prices. BH-540 is the most popular maize variety in the region, but due to low yield and a synchronization problem it is difficult to include it in seed production. Instead BH-660 was selected for its ease of production. Gera, Wochecha and Guasa varieties are selected for potato seed production. Pulses are included for rotation purposes only: farmers traditionally grow chickpea and grass pea after teff and wheat.

#### **Production and marketing plans**

A seed production plan for three years is prepared. During the project period, a total of 783 tons of raw seed will be produced, consisting of 158 tons of hybrid maize and 625 tons of potato seed (Table 6.4). After processing, a total of 642 tons of clean seed of hybrid maize and potato will be marketed in the project period. The current market situation is taken into consideration in determining the price. Although the ESE and/or other suppliers sell the seed at lower prices, farmers are obliged to buy hybrid maize for Birr 10 and potato for Birr 4.5 per kg, due to high demand in the area and neighbouring towns.

#### **Financial plan**

To undertake this project, an initial capital of Birr 500,000 is required. In the first year, the estimated revenue of Birr 688,000 will be generated from seed sales of 32 tons of maize seed and 100 tons of potato seed. The total production cost is expected to be

Birr 611,875. A net profit of Birr 1,434 and 303 will be achieved per ton of maize and potato respectively. This calculation does not include promotion costs (see also Table 6.5).

**Table 6.4** Seed production and marketing plan of the Avola Goshiye community-based seed enterprise

| <i>Crop</i> | <i>Raw seed produced (tons)</i> |             |             | <i>Cleaned seed (tons)</i> |             |             | <i>Selling price/ kg (Birr)</i> |
|-------------|---------------------------------|-------------|-------------|----------------------------|-------------|-------------|---------------------------------|
|             | <i>2007</i>                     | <i>2008</i> | <i>2009</i> | <i>2007</i>                | <i>2008</i> | <i>2009</i> |                                 |
| Maize       | 35                              | 53          | 70          | 31                         | 47          | 63          | 9.00                            |
| Potato      | 125                             | 250         | 250         | 100                        | 200         | 200         | 4.00                            |

**Table 6.5** Income and expense budget of the Avola Goshiye community-based seed enterprise for 2007

| <i>Income</i>                      | <i>Maize</i> | <i>Potato</i> | <i>Total</i> |
|------------------------------------|--------------|---------------|--------------|
| Sales volume (tons seed sold)      | 32           | 100           | 132          |
| Average selling price per ton seed | 9,000        | 4,000         |              |
| Value of sales                     | 288,000      | 400,000       | 688,000      |
| Total cost of seed produced        | 169,275      | 311,500       | 480,775      |
| Total overheads                    | 72,850       | 58,250        | 131,100      |
| Net profit                         | 45,875       | 30,250        | 76,125       |
| Gross margin per ton of seed sold  | 3,710        | 885           | 1,570        |
| Net profit per ton of seed sold    | 1,434        | 303           | 577          |

Note: all amounts are in Birr (ETB).

### **Constraints and opportunities**

Physical, socio-economic and technical constraints can be identified which limit agricultural development in general, and the seed sector in particular. The most important constraint is land fragmentation and population pressure: this means that a large number of farmers are required in order to produce enough seed. For example to produce seed on 15 ha, about 60 farmers with an average land holding of 0.25 ha are required. Moreover, it is difficult to cluster seed production fields. Declining natural resources (soil fertility and forest) threaten production and the long-term productivity of the farmland. Environmental fluctuations (flood, hail, unreliable rain fall) particularly affect rain-fed agriculture. Most improved seed supply is from research (the ESE or the BoARD), which only covers 12% of the total seed demand. There are no private companies engaged in the seed business, with the exception of some individual efforts. A loose regulatory system creates an insecure business environment. For example, underweight packs and expired fertilizers are sold to farmers by private suppliers and cooperatives. This causes farmers to distrust cooperatives, which potentially disadvantages seed enterprises operating as cooperatives. Local varieties may be preferred but still have a low productivity and may suffer from crop pests and diseases. Crop improvement programmes have paid little attention to traditional varieties and farmers criteria. Farmers lack awareness on

quality seed production, management and marketing systems. Finally, there is a shortage of initial basic seed for various crops (e.g. potato).

The following opportunities have been identified as creating a favourable environment for the establishment of a CBSE. Various stakeholders have shown their commitment (research, the ESE, BoARD cooperatives, cooperative agency) to supporting the enterprise and efforts to increase seed availability to farmers. Roads are improved, resulting in better market access. Development agents and a cooperative agency are present in the kebele and willing to support the enterprise. Capacity building institutions (university, agricultural colleges, and farmers training centres) are willing to support the initiative. A final opportunity is the existence of irrigation facilities that are available for seed production. Agricultural polices encourage the private sector.

### **Essential support and proposed follow-up activities**

Various stakeholders contribute to establishing and operating the CBSE: cooperatives, research, the BoARD, the ESE, the cooperative agency and World Vision Ethiopia. Their roles and responsibilities are listed in Table 6.6. After establishing the enterprise, its structure needs to be finalized. Legal formalities among the member farmers need to be arranged, with the support of the cooperative agency. Basic initial seed, credit and other inputs need to be purchased and supplied, and land preparation and planting needs to be organized. Throughout the entire process, seed producer farmers and technicians participate in training and capacity building.

**Table 6.6** Essential support required for the establishment of Avola Goshiye seed enterprise

| <i>Stakeholder</i> | <i>Roles and responsibilities</i>  |
|--------------------|--|
| Cooperatives       | <ul style="list-style-type: none"> <li>• Provide facilities (store, office, credit)</li> <li>• Timely input supply</li> <li>• Support in seed marketing</li> </ul>   |
| Cooperative agency | <ul style="list-style-type: none"> <li>• Organize farmers for CBSE</li> <li>• Develop organizational structure of the enterprise</li> <li>• Technical support and training</li> </ul>  |
| Research           | <ul style="list-style-type: none"> <li>• Provide basic seed of potato</li> <li>• Technical support and training</li> <li>• Storage facilities for potato seed</li> </ul>   |
| BoARD              | <ul style="list-style-type: none"> <li>• Lead and organize stakeholders for the pilot project</li> <li>• Provide technical support and credit</li> <li>• Training and quality control service</li> </ul>                                 |
| WoARD              | <ul style="list-style-type: none"> <li>• Site selection and awareness raising among farmers</li> <li>• Facilitation of input supply and training</li> <li>• Provide technical support</li> <li>• Monitoring the pilot project</li> </ul> |
| ESE                | <ul style="list-style-type: none"> <li>• Provide parental line of hybrid maize BH-660</li> <li>• Training and technical support on hybrid maize production</li> </ul>  |
| World vision       | <ul style="list-style-type: none"> <li>• Financial support</li> </ul>  |

### **6.3 Erer Union Seed Producers and Marketing Cooperative, Gimbichu district, Oromia region\***

*Shemsu Baissa, Imiru Mijana, Eshetu Sisay, Demissie Mitiku, Ali Adem, Tadesse Wube and Zenebe W. Silase*

It has been widely recognized that improved seed holds the key to enhanced farm productivity and better livelihoods. In spite of decades of efforts by the government, the private sector and donors to support seed availability and access in Ethiopia, the seed situation remains dismal. The formal seed sector, represented by the publicly owned Ethiopian Seed Enterprise and the private sector, has had considerable success in seed production and supply of hybrid maize and bread wheat varieties. However, the geographic coverage is limited in scope and only a few varieties are produced that have wider adaptation. The supply of seed for pulses is very low, while that of oilseeds, or seeds for vegetables, fruits, spices and forage is negligible.

Ethiopia's seven million smallholder farmers (with landholdings of 1-2 hectares) produce more than 95% of the total agricultural output. The established practice of farmers saving a portion of their harvest for planting the next crop (part of informal seed system) is dominant. This means that the informal system accounts for more than 95% of the seed supply in the country. In Ethiopia in general and in Oromia regional state in particular, awareness is growing, as is interest in helping the informal seed sector, enhancing its contribution to seed security, and establishing adequate links with the formal seed sector. The stronger and more inclusive national seed system that can be achieved in this way will make a significant contribution towards the attainment of food security at all levels.

Cognizant with the role of the informal seed sector in Ethiopia, the tailor-made training programme on supporting informal seed supply was implemented from October 2006 to October 2007. Seed experts representing different stakeholders at federal and regional levels, including those from the Oromia region, participated in this programme. After theoretical and practical sessions, one of the Oromia teams conducted a participatory seed system analysis and seed demand survey in Gimbichu district. This section focuses on the outcome of this analysis and the experiences with the establishment of a small-scale seed enterprise.

#### **The seed supply situation in Gimbichu district**

The participatory seed system diagnosis conducted at Seftu and Kersa community in Gimbichu district revealed that both the informal and formal seed systems are functional, while the informal system is dominant in the area. Farmers use their own saved seed for the production of most crops. The provision through the formal system of seeds of improved varieties of bread wheat, lentil and chickpea is part of an

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\* This section is an output of the Oromia Central East regional team participating in the ESE/WUR/ICARDA Tailor Made Training Programme on Revitalizing farmer-based seed production and supporting informal seed supply of local crops in Ethiopia, supported by Nuffic (The Netherlands).

extension programme supporting high input packages which has played an important role in increasing agricultural productivity and production. In spite of all the efforts undertaken by GOs and NGOs, availability of and access to seed of improved crop varieties still remains a major constraint. There is a need for a strategy that alleviates these problems. The establishment of small-scale seed enterprises is one of the strategies that can provide a solution.

### Overview of the enterprise

The overall objective of the small-scale seed enterprise is to address availability of and access to seed of improved crop varieties at the village level to ensure food self sufficiency and improve the livelihood of the rural people. The specific objectives are: (i) to strengthen the capacity of farmers in seed production techniques; (ii) to build seed processing and storage facilities at village level; (iii) to produce and market quality seed; (iv) to conserve farmer varieties; (iv) to link the informal seed system with the formal system; (v) to create job opportunities for the farming community; and (vi) to increase the income of the farming community.

The enterprise is called Erer Union Small-scale Seed Enterprise. It will be established under the umbrella of Erer farmers' Cooperatives Union, which includes voluntarily cooperatives in four districts. The enterprise will take the form of a Seed Producers' and Marketing Cooperative (SPMC). The area of operation of the Union includes Gimbichu, Ade'a, Liban chukala and Akaki districts of East Shewa zone of Oromia region. The main purpose of the Union is to procure agricultural inputs and provide services to its members at a reasonable price. SPMC can contribute to overcoming shortages of improved seed, and other seed-related problems in the area.

It is agreed that the enterprise is to be located in Bishoftu town. Bishoftu is situated 46 km east of Addis Ababa, the capital of Ethiopia. It is the central town for the four districts in which the union is operating, and is therefore accessible.

Rainfed agriculture predominates in the Gimbichu district. The average farm size ranges from 2 to 3 hectares, with farmers allocating the available smallholding to different crops. Farmers in the study area use diversification as means of risk minimization. Because of these facts, the number of SPMC members is currently 323. As the seed production area increases, the number of farmers should increase accordingly, to secure enough land for subsequent seed production. The number of farmers required for the coming three years is indicated in Table 6.7

**Table 6.7** Number of farmers required in establishing Erer Union Seed Producers' and Marketing Cooperative

| <i>Crop</i> | <i>Average seed rate (kg/ ha)</i> | <i>Average farm area (ha)</i> | <i>Number of farmers</i> |      |      |
|-------------|-----------------------------------|-------------------------------|--------------------------|------|------|
|             |                                   |                               | 2007                     | 2008 | 2009 |
| Wheat       | 150                               | 1                             | 67                       | 121  | 133  |
| Lentil      | 80                                | 1                             | 150                      | 169  | 186  |
| Chickpea    | 120                               | 0.5                           | 106                      | 116  | 128  |
| Total       |                                   |                               | 323                      | 2414 | 2456 |

### **Legal form and structure of the enterprise**

In the regional context and prevailing situation, the legal form of the enterprise should be a Seed producers' and Marketing Cooperative. Cooperatives are tax-exempted and have access to credits and marketing services. The Cooperative Promotion Office provides assistance in organizing farmers and legalizing their entity as cooperatives, and provides free external auditing services. The agriculture and rural development office at district (woreda) level provides technical support for seed production and quality control. Three development agents are assigned to work with farmers at village level. A broad base of experience of establishing cooperatives in the district is available. Cooperatives functioning in the district include Hawi Boru Seed producers' and Cheffe donsa Local Crop Conservation Cooperatives, and Lemlem-Cheffe and Choba Seed Producers' and Farmers' Cooperatives.

The structure of an SPMC follows the legally established format for cooperatives; it includes a general assembly, an executive committee, a credit committee and an audit committee. The general assembly consists of all members of the cooperative. Each committee has three members (chairman, vice chairman and secretary) and all committee members are elected by the general assembly.

### **Crops and varieties selected for the business**

The participatory seed system analysis identified bread wheat as the major crop grown in terms of area coverage. HAR 604 and HAR 1685 are the two most widely cultivated high yielding dwarf bread wheat varieties. Many farmers allocate a larger area of their landholding for the production of these two varieties. Lentil is the second dominant crop, and the most popular improved variety is called 'Alemaya'. During the participatory seed system analysis the farmers indicated a high demand for seed of improved crop varieties while seed supply hardly meets this demand. In general, there is a great seed demand of improved varieties of bread wheat, lentil and chickpea in the area. Therefore, the three crops are identified for starting a seed business. The seed system analysis revealed that farmers preferred the varieties 'HAR 604' (bread wheat), 'Alemaya' (lentil) and 'Arerti' (chickpea). 'HAR 604' covers the largest area and performs very well in terms of yield and quality. Of the released lentil varieties, 'Alemaya' is in highest demand in the market because of its yield potential. 'Arerti' is a Kabuli type chickpea with bigger seeds and better market demand than the desi types which have small seeds.

### **Production, marketing and financial plans**

The production plan explains the requirements for producing the seed to be sold for the next three years. It is based on the demand survey which is part of the seed system analysis. The basic seed requirement for the same year has also been prepared. The Ethiopian Seed Enterprise needs to commit itself to supplying the SPMC with this quantity of basic seed. The production plan also includes the area requirement for the production of certified seed, the basic seed requirement and the area for certified seed production (Tables 6.8 and 6.9).

**Table 6.8** Seed production plan (tons/year) and area required for Erer Union Seed Producers' and Marketing Cooperative for period 2007-2009

| <i>Crop</i> | <i>Seed production (t/year)</i> |      |      | <i>Average farm yield (t/ha)</i> | <i>Seed grower price (Birr/t)</i> | <i>Area for seed production</i> |      |      |
|-------------|---------------------------------|------|------|----------------------------------|-----------------------------------|---------------------------------|------|------|
|             | 2007                            | 2008 | 2009 |                                  |                                   | 2007                            | 2008 | 2009 |
| Wheat       | 200                             | 726  | 799  | 3                                | 3000                              | 67                              | 242  | 266  |
| Lentil      | 230                             | 253  | 278  | 1.5                              | 5400                              | 153                             | 169  | 186  |
| Chickpea    | 79                              | 87   | 95   | 1.5                              | 5520                              | 53                              | 58   | 64   |
| Total       |                                 |      |      |                                  |                                   | 273                             | 2477 | 2525 |

**Table 6.9** Basic seed required (tons) by Erer Union Seed Producers' and Marketing Cooperative for the period 2007-2009

| <i>Crop</i> | <i>Basic seed cost (Birr/t)</i> | <i>Basic seed required (tons)</i> |      |      |
|-------------|---------------------------------|-----------------------------------|------|------|
|             |                                 | 2007                              | 2008 | 2009 |
| Wheat       | 3520                            | 10                                | 36   | 40   |
| Lentil      | 6600                            | 12                                | 14   | 15   |
| Chickpea    | 6400                            | 6                                 | 7    | 8    |

The first step in developing the business plan is to define the marketing strategy for achieving the business goal and selling the seed. This includes identifying, informing, and servicing customers, and making the actual sales. To create a broader and more sustainable market outlet, the Seed Producers' and Marketing Cooperative (as an enterprise) will be integrated into Erer Farmers' Cooperative Union. If there is any surplus certified seed, it can be sold to other districts in which the Union operates. In setting the seed price, the production cost, the grain price of the seed crop and the basic seed price of the Ethiopian Seed Enterprise are considered. The marketing plan of the enterprise is described in Table 6.10.

**Table 6.10** Total seed sales plan (t/year) for the Erer Union Seed Producers' and Marketing Cooperative for the period 2007-2009

| <i>Crop</i> | <i>Seed sold (tons/year)</i> |      |      | <i>Selling price/kg</i> |
|-------------|------------------------------|------|------|-------------------------|
|             | 2007                         | 2008 | 2009 |                         |
| Wheat       | 180                          | 660  | 726  | 3.55                    |
| Lentil      | 200                          | 220  | 242  | 6.90                    |
| Chickpea    | 75                           | 823  | 91   | 6.70                    |

The financial strategy brings the marketing and production strategies together in an income and expense budget to see if the plan is profitable, and works out schemes for financing, monitoring and evaluating the plan. The income and expense budget for the year 2007 is given in Table 6.11.

**Table 6.11** Income and expense budget for the Erer Union Seed Producers' and Marketing Cooperative for 2007

|                                    | <i>Bread<br/>wheat</i> | <i>Lentil</i> | <i>Chickepea</i> | <i>Total</i>   |
|------------------------------------|------------------------|---------------|------------------|----------------|
| <i>Income</i>                      |                        |               |                  |                |
| Sales volume (t basic seed)        | 10                     | 12.3          | 6.4              | 51.7           |
| Average selling price/t seed       | 3,520                  | 6,600         | 6,400            |                |
| Value of sales                     | 35,200                 | 81,180        | 40,960           | 157,340        |
| Sales volume (t CSC1)              | 180                    | 200           | 75               | 875            |
| Average selling price/t seed       | 3,550                  | 6,900         | 6,700            |                |
| Value of sales                     | 639,000                | 1,380,000     | 502,500          | 2,521,500      |
| Sales volume t/by-product          | 20                     | 29.9          | 3.1              | 53             |
| Average selling price t/by-product | 2,000                  | 3,000         | 3,000            |                |
| Value of sales                     | 40,000                 | 89,700        | 9,300            | 1,39,000       |
| Total value of sales               | 714,200                | 1,550,880     | 511,875          | 2,776,955      |
| <i>Expense</i>                     |                        |               |                  |                |
| Quantity of seed purchased (t)     | 200                    | 230           | 79               | 508            |
| Seed purchase price (Birr/t)       | 3,000                  | 5,400         | 5,520            |                |
| Total cost of raw seed (Birr)      | 600,000                | 1,242,000     | 434,976          | 2,276,976      |
| Cost of basic seed                 | 35,200                 | 81,180        | 40,960           | 157,340        |
| Processing costs                   | 30,000                 | 34,500        | 11,820           | 76,320         |
| Packaging (bags)                   | 10,800                 | 17,200        | 3,942            | 31,942         |
| Labour                             | 12,000                 | 13,800        | 4,728            | 30,528         |
| Total cost of seed produced        | 688,000                | 1,388,680     | 496,426          | 2,573,106      |
| Gross margin profit                | 26,200                 | 162,200       | 15,449           | 203,849        |
| <i>Overhead costs</i>              |                        |               |                  |                |
| Staff (inspectors)                 | 24,480                 | 8,280         | 3,240            | 36,000         |
| Total overhead costs               | 24,480                 | 8,280         | 3,240            | 36,000         |
| Grand Total Cost                   | 712,480                | 1,396,960     | 499,666          | 2,609,106      |
| <i>Net profit</i>                  | <i>1720</i>            | <i>153920</i> | <i>12209</i>     | <i>167,849</i> |
| <i>Net profit percentage</i>       |                        | <i>11%</i>    | <i>2%</i>        | <i>6%</i>      |

### Constraints and opportunities

There are some constraints on the implementation of this community-based seed enterprise configured as a seed producers' and marketing cooperative. The main constraints are: the shortage of basic seed, small landholdings, rigid seed certification standards, the limited availability of alternative improved crop varieties (e.g. lentil) and poor linkages among stakeholders.

Many opportunities exist for the successful establishment of the SPMC. The foremost opportunity is that farmers are willing to actively participate in seed business. Agricultural inputs, especially seed, are exempted from tax. There is a lot of demand among farmers for seed of improved crop varieties. Because of higher current grain price, farmers are in a better financial position to purchase seed for a reasonable price. Moreover, food processing factories and cottage industries are located in the vicinity of the SPMC, creating a favourable environment stimulating production. Grain export opportunities exist through farmers' cooperative unions. Good access to the capital

city and other towns such as Bishftu, Modjo and Adama also creates favourable conditions for establishing the enterprise.

### **Essential support and proposed follow-up activities**

A successful SPMC requires financial support for working capital, seed processing machines and seed storage. To create awareness and build the capacity of the experts to implement the pilot programme in the plan year (2007/2008), various trainings were organized for zonal and woreda (district) experts and development agents. These trainings took place at Assela town over three consecutive days. Topics addressed were general seed multiplication principles; small-scale farmer-based seed production systems; field inspection procedures for self-pollinated crops; field inspection procedures for maize; seed sampling techniques and agricultural marketing. Focal personnel have been assigned to the two project sites to carry out activities pertinent to the pilot project at woreda and PA level. Seftu and Lemlem-cheffe peasant communities have been selected for the pilot project in Gimbichu woreda. A total of 206 model farmers experienced with the extension package and seed multiplication programme have been selected and trained in seed multiplication. The planting operation for the pilot programme was started in 2007. A total of 140 hectare of land has been covered with seed so far in the two communities in August 2007, including 95 ha with bread wheat and 45 ha with lentils.

As mentioned above, some activities had already been started at the moment of writing this section. Follow-up activities that should still be carried out include more technical operations such as planting, seed quality control, seed crop management, seed crop harvesting, seed testing and seed processing. Other more business-oriented operations include developing a logo, preparing packaging material with the logo on it, seed marketing, pilot programme evaluation, and looking for further funding to enforce and support an economically viable SMPC.

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## **6.4 Wamura-Sako Small-scale Farmers Seed Producers' Group in Dendi woreda, central west Oromia region \***

*Messele Shimels, Assefa Senbeta, Hagos Gidey, Goshime Tekle, Fikre Mulugeta, Adugna Kefeni and Girma Chemedda*

In Ethiopia, the agricultural sector is the main producer of food and the supplier of export products. It is also the largest sector providing employment in the country, with more than 80% of the population engaged in the sector. Crop production has the

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\* This section is an output of the Oromia Central West regional team participating in the ESE/WUR/ICARDA Tailor-Made Training Programme on Revitalizing farmer-based seed production and supporting informal seed supply of local crops in Ethiopia, supported by Nuffic (The Netherlands).

largest share and is predominately characterized by small-scale production. However, productivity remains at low levels, due mainly to low-level use of improved technologies like improved seed.

The use of improved seed in the country is very low and more than 90% of the seed planted annually is the farmers' own saved seed and seed exchanged among farmers. To increase crop production and productivity, it is very important to improve the quality of seed saved by farmers and to increase improved seed coverage.

Professionals of various relevant institutions at federal and regional levels including those from the Oromia region participated in the tailor-made training programme on developing mechanisms supporting farmer-based seed production and informal seed supply. One of the two regional teams from Oromia conducted a participatory seed system analysis and seed demand survey in the Dendi district. This paper presents a summary of the outcomes of the participatory seed system analysis and of the business plan for the establishment of a small-scale farmers' seed producer group as an option for strengthening local seed supply in this district.

### **The seed supply situation in Dendi district**

Dendi woreda is located in central Ethiopia; its main town Ginchi is located 72 km west of Addis Ababa on the Addis-Ambo main road. The participatory seed system analysis was carried out in Olonkome and Wamura development sites (*yelimat tabiya*) which are important structures in the woreda. These sites have six and three kebeles respectively. Dendi woreda has a total area of 109,492 ha, of which 76% (71,681 ha) is cultivated, while the rest is occupied by grazing land, bush/forest land, villages, valleys, rivers, etc. The average farm size is 2.5 ha. Farmers at the two sites practise mixed farming, i.e. crop and livestock production. The main crops produced are cereals, pulses, oilseeds and spices. Specifically important crops are teff, barley and wheat, covering 28, 26 and 22% of the area under annual crops, respectively. Crop production is mainly performed during the main (*Meber*) season from mid-June to December/January. Farmers also practice double cropping.

The participatory seed system analysis conducted in Dendi woreda showed that the crops and varieties grown are highly diversified. Farmers listed 15 crops with 40 varieties. Teff is the most diverse with seven varieties, and chickpea is the second most diverse with five varieties. The majority of other crops each have two to three varieties, whereas grass pea and mustard each have one variety. Most varieties are identified as local varieties except for Kubsu (wheat), Shasho and Marye (chickpea), and Bh660 (maize), which are improved varieties. In many cases, farmers could not distinguish between improved and local crop varieties, either because the varieties were introduced a long time ago or because the seed was purchased from the local market. Examples include teff varieties like Magna, Golelisa, Qoledima, and a field pea variety named Nechi.

### **Assessment of the seed market**

The major constraints in the seed market identified during the participatory seed system analysis are the shortage of seed of improved varieties of wheat, maize and chickpea; delayed supply of improved seeds; limited attention to the maintenance,

improvement, and production of local varieties resulting in the extinction of varieties; and the presence of few seed producers and distributors. The annual average crop areas for 2003-2005 indicate that teff, wheat and barley cover more than 75% of the area. Maize, chickpea and lentil occupied only 4%, 3% and 1%. Thus, the woreda is considered a potential seed market for these crops. The six crops occupying 82% of the area have a theoretical seed requirement of 61,260 quintals each year, computed based on theoretical seeding rate. When considering seed production in woina dega agro-climatic zone (e.g. Wamura), the assessment of the potential seed demand was based on only 72% of the crop area. Based on these assumptions any seed producer for these crops will have a potential demand of 31,749 quintals with an estimated market value of 10.64 million Birr in Dendi woreda. The potential demand and market value of each crop is presented in Table 6.12.

**Table 6.12** Potential seed demand of major crops grown in Dendi woreda

| <i>Crop</i> | <i>Average crop area (ha)</i> | <i>Seed rate (qt/ha)</i> | <i>Total seed needed (qt)</i> | <i>ESE current price (Birr/qt)</i> | <i>Potential market value (Birr)</i> |
|-------------|-------------------------------|--------------------------|-------------------------------|------------------------------------|--------------------------------------|
| Teff        | 15,804                        | 0.3                      | 4,741                         | 324                                | 1,536,195                            |
| Wheat       | 13,221                        | 1.5                      | 19,832                        | 260                                | 5,156,237                            |
| Chick pea   | 2,135                         | 1.2                      | 2,562                         | 385                                | 986,524                              |
| Maize       | 3,303                         | 1.2                      | 3,964                         | 650                                | 2,576,600                            |
| Lentil      | 541                           | 1.2                      | 649                           | 600                                | 389,520                              |
| Total       | 35,005                        |                          | 31,749                        |                                    | 10,645,076                           |

Source: Woreda agricultural office, ESE and Computation.

According to the woreda agricultural office, on average 4,627 ha (6%) is covered with improved seed, including the area planted with recycled seed. The remaining 94% of the area is covered with seed obtained from own saved seed, the local market or farmers' seed exchange. The improved seed coverage is even lower in the five kebeles surveyed for the study, i.e. of the 6,286 ha, only 130 ha (2%) is covered with improved seed of teff, wheat and maize crops. To be realistic, the figures for potential demand were lowered in line with farmers' assumed seed replacement rate. Taking three years' seed replacement, the annual demand in the area is estimated to be 10,500 tons.

### **Overview of the enterprise**

Farmers in Wamura Sako and Werka Warebu peasant associations were encouraged to establish the Wamura-Sako Small-scale Farmers Seed Producer Group, which will undertake seed production and marketing, primarily for the Wamura development site, neighbouring farmers, and farmers in adjacent woredas. The objectives of the Wamura-Sako Small-scale Farmers Seed Producer group are to ensure an adequate and timely supply of quality seed of improved and local varieties by producing, processing and distributing the seed; to contribute to the conservation of local varieties by producing and organizing diversity fairs in collaboration with pertinent bodies like the IBC; and to make a reasonable profit from the sales of improved and local seed varieties. Its proposed legal basis is based on the cooperatives law.

### Crop and varieties identified

The results of the participatory seed system analysis and seed demand survey are used to identify crops and varieties. A number of criteria were used, including the annual crop area (number of beneficiaries and market potential), the suitability and profitability of the crops, the seed demand and availability of local crop varieties, production technology and management requirement levels of crops, results of prioritizing crop varieties, experiences of farmers in producing crops, and farmers' opinions on the plan. Table 6.13 summarizes the proposals on the type of crops and varieties to be included in the portfolio of the seed producers' group.

**Table 6.13** Crops and varieties selected for seed business for Wamura-Sako Small-scale Farmers Seed Producer Group, Dendi woreda

| <i>Crops</i> | <i>Varieties</i>              | <i>Improved/local</i> |
|--------------|-------------------------------|-----------------------|
| Teff         | Magna                         | Local and improved    |
| Wheat        | Kubsa (HAR 1685), Tikur sinde | Improved and local    |
| Chickpea     | Missire, Shasho               | Local                 |
| Lentil       | Alemaya                       | Improved              |

### Production, marketing and financial plan

To meet its sales targets, the seed group will start producing seed on 200 ha of land owned by members in the first year, and expand to 331 and 422 ha in the second and third years. To allow expansion of the area, the group will contract neighbouring farmers. The quantities of raw seed produced, and the estimated yield per hectare are summarized in Table 6.14.

**Table 6.14** Area, yield and raw seed production for Wamura-Sako Small-scale Farmers Seed Producer Group, Dendi woreda

| <i>Crops</i> | <i>2008/09</i>   |                     |                     | <i>2009/10</i>   |                     |                     | <i>2010/11</i>   |                     |                     |
|--------------|------------------|---------------------|---------------------|------------------|---------------------|---------------------|------------------|---------------------|---------------------|
|              | <i>Area (ha)</i> | <i>Yield (q/ha)</i> | <i>Raw seed (q)</i> | <i>Area (ha)</i> | <i>Yield (q/ha)</i> | <i>Raw seed (q)</i> | <i>Area (ha)</i> | <i>Yield (q/ha)</i> | <i>Raw seed (q)</i> |
| Teff         | 88               | 10                  | 876                 | 88               | 13                  | 1,156               | 88               | 14                  | 1,232               |
| Wheat        | 70               | 25                  | 1,750               | 70               | 35                  | 2,450               | 70               | 35                  | 2,450               |
| Chickpea     | 32               | 14                  | 452                 | 32               | 16                  | 512                 | 32               | 16                  | 512                 |
| Lentil       | 10               | 8                   | 76                  | 10               | 10                  | 100                 | 10               | 10                  | 100                 |
| Total        | 200              |                     | 3,154               | 200              |                     | 4,218               | 200              |                     | 4,294               |

The raw seed purchased from farmers is collected and cleaned to maintain quality. The cleaned seed is sold to customers at a price with minimum profit margins. The seed group will produce and sell approximately 2600, 3100, and 3900 quintals of local and improved varieties of teff, wheat, chickpea and lentil seed, which will cover 16%, 22%, and 27% of the current estimated potential market for the years 2008/09, 2009/01 and 2010/11 respectively. The planned amounts of seed sold and prices are presented in Table 6.15.

**Table 6.15** Quantity of seed sold, price and total revenue in 2008/9, 2009/10 and 2010/11

| <i>Crop</i> | <i>2008/09</i>    |                      |                      | <i>2009/10</i>    |                      |                      | <i>2010/11</i>    |                      |                      |
|-------------|-------------------|----------------------|----------------------|-------------------|----------------------|----------------------|-------------------|----------------------|----------------------|
|             | <i>Seed sales</i> | <i>Selling price</i> | <i>Total revenue</i> | <i>Seed sales</i> | <i>Selling price</i> | <i>Total revenue</i> | <i>Seed sales</i> | <i>Selling price</i> | <i>Total revenue</i> |
| Teff        | 701               | 629                  | 441                  | 468               | 619                  | 289                  | 585               | 616                  | 360                  |
| Wheat       | 1,487             | 375                  | 557                  | 2,249             | 373                  | 840                  | 2,738             | 396                  | 1,084                |
| Chickpea    | 384               | 581                  | 223                  | 320               | 570                  | 183                  | 449               | 605                  | 271                  |
| Lentil      | 65                | 632                  | 41                   | 81                | 622                  | 50                   | 130               | 657                  | 85                   |
| Total       | 2,637             |                      | 1,263                | 3,117             |                      | 1,362                | 3901              |                      | 1,801                |

Note: Seed sales in quintals; selling price in Birr/quintal; total revenue \* 1000 Birr.

For each crop, the total cost of production (direct and indirect) is estimated for the three years. Annual seed sales, selling price, revenues, production costs and profits were analysed for three years. The summary of the financial plan and the profitability is presented in Table 6.16.

**Table 6.16** Summary of the financial analysis for 2008/9, 2009/10 and 2010/11

| <i>Description</i>           | <i>2008/2009</i> |              |                  |               |              |
|------------------------------|------------------|--------------|------------------|---------------|--------------|
|                              | <i>Teff</i>      | <i>Wheat</i> | <i>Chick pea</i> | <i>Lentil</i> | <i>Total</i> |
| Seed sales (q)               | 701              | 1,487        | 384              | 65            | 2,637        |
| Total revenue (Birr)         | 471,398          | 589,860      | 234,027          | 43,283        | 1,338,568    |
| Total cost (Birr)            | 461,619          | 571,742      | 224,686          | 41,724        | 1,299,770    |
| Net profit before tax (Birr) | 9,779            | 18,119       | 9,341            | 1,559         | 38,798       |
| Total cost (Birr/q)          | 659              | 384          | 585              | 642           | 493          |
|                              | <i>2009/2010</i> |              |                  |               |              |
| Seed sales (q)               | 468              | 2,249        | 320              | 81            | 3,117        |
| Total revenue (Birr)         | 329,825          | 937,882      | 200,525          | 55,966        | 1,524,198    |
| Total cost (Birr)            | 316,049          | 897,900      | 191,834          | 53,565        | 1,459,348    |
| Net profit before tax (Birr) | 13,775           | 39,982       | 8,691            | 2,401         | 64,849       |
| Total cost (Birr/q)          | 676              | 399          | 599              | 661           | 468          |
|                              | <i>2010/2011</i> |              |                  |               |              |
| Seed sales (q)               | 585              | 2,738        | 449              | 130           | 3,901        |
| Total revenue (Birr)         | 410,832          | 1,203,067    | 296,860          | 94,334        | 2,005,093    |
| Total cost (Birr)            | 393,678          | 1,151,470    | 283,934          | 90,267        | 1,919,349    |
| Net profit before tax (Birr) | 17,154           | 51,596       | 12,926           | 4,068         | 85,744       |
| Total cost (Birr/q)          | 674              | 421          | 633              | 694           | 492          |

### **Essential support and proposed follow up activities**

The profit and loss analysis shows that the seed producers' group is profitable. However, initially the pilot project requires various types of support. This is necessary since the implementation requires the involvement of many farmers who do not have the same level of awareness, experience and knowledge of running a seed business. Initial support is required for coordination, financing, training, extension and technical issues. The implementation of the proposed seed producers' group was scheduled to start from August 2007. The establishment of the group could be guided by experience gained from some activities undertaken at the proposed seed production sites as part of the regional seed multiplication programme.

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## **6.5 Wamole farmers' cooperative for maize seed production in Boricha woreda, SNNPR\***

*Tesfaye Tadesse, Tefera Zeray, Mata Gedebo, Abebe Tilahu and Solomon Benor*

Agriculture is the major economic activity in the Southern Nations, Nationalities and Peoples' Region (SNNPR) of Ethiopia. However, the performance of the agricultural sector lags behind, despite the rapidly growing population and increased demand for food and feed. The most important constraints are the few available improved varieties, limited access to seed, and the untimely supply of seeds and other agricultural inputs. Several farming systems are practised in the regions within various agro-climatic zones. Mixed farming (crop and livestock), large-scale commercial farming and pastoral farming are prevalent. The majority of farmers (94%) are engaged in mixed farming. Major crops include maize, wheat, teff, barley, sorghum, coffee and enset. To assess the extent of seed supply and local knowledge on seed management, and to establish a small-scale seed enterprise, a participatory seed system analysis and a seed demand survey were conducted in selected kebeles, i.e. Guana Bulano and Fulasa Aldada in Boricha. Data from the Woreda Office of Agriculture indicated that about 37,500 hectares are cultivated in the area. Haricot bean is grown as relay cropping. Farmers leave haricot bean in the field while harvesting the maize crop and allow it to grow to full maturity before harvesting it. This practice results in the area covered with haricot bean being very similar to that of maize. Out of the total area cultivated, the share for maize and haricot bean was 38% and 37%, respectively. Following maize and haricot bean, enset accounts for 21%, demonstrating the importance of this crop as the area's staple food.

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\* This section is an output of SNNPR (South) regional team participating in the ESE/WUR/ICARDA Tailor-Made Training Programme on Revitalizing the farmer-based seed production and supporting informal seed supply of local crops in Ethiopia, supported by Nuffic (The Netherlands).

### The seed supply situation in Boricha district

A participatory seed system analysis and a demand survey were conducted in two target communities, Gonuwa Bulano and Fulasa Aldada. The results characterize the areas by recurrent drought, high population density, strong farmers' demand for improved seed, low supply of improved seeds, and little attention to the informal seed system, especially to local variety maintenance. Both the formal and informal seed systems are seed sources for farmers. The informal sector is the main supplier of seed for crops and local varieties like enset, haricot bean, potato, and sweet potato. The seed of local crops and varieties is obtained from farm-saved seed, the local market, relatives and neighbours. Among these, farm-saved seed and seed from local grain markets are major sources (Table 6.17). The formal sector is responsible for seed supply of maize hybrids and some of the supply of haricot bean varieties (Table 6.17). Various stakeholders act as direct or indirect seed sources. They include the Bureau of Agriculture and Rural Development (BoARD), the Ethiopian Seed Enterprise (ESE), the agricultural research centre, local and international NGOs, local markets and churches. The ESE and NGOs supply improved seeds through the Woreda Agriculture Office. Through the BoARD, the ESE plays a major role as a source of improved maize varieties (BH-540 and BH-140).

**Table 6.17** Seed source and frequency of purchase in Boricha woreda

| <i>Source</i>   | <i>Crop</i>                    | <i>Type</i> | <i>Frequency</i>         |
|-----------------|--------------------------------|-------------|--------------------------|
| Self maintained | Enset<br>Haricot bean<br>Maize | Local       |                          |
| BoARD           | Maize<br>Haricot bean          | Improved    | Every year<br>Occasional |
| Relatives       | Enset                          | Local       | Occasional               |
| Local market    | Haricot bean<br>Teff           | Local       | Occasional               |
| Churches        | Haricot bean                   | Improved    | Occasional (gift)        |
| NGOs            | Haricot bean                   | Improved    | Gift through BoARD       |

Although the formal system is operating in the area, seed demand for improved varieties is not yet satisfied. Thus it is important to establish a small-scale seed enterprise in the area. However, such an effort needs to overcome many barriers. These include fragmented land holdings and the consequent difficulties in maintaining minimum isolation distance; this is particularly relevant to hybrid maize seed production. Other limitations are insecure rainfall patterns and the lack of irrigation facilities. Therefore, the team selected an existing cooperative, Wamole irrigation cooperative, in the nearby woreda of Shebedino as the basis for a small-scale seed enterprise. Upon analysis of the market demand and profitability of seed production, the team supporting the cooperative seed production pilot project recommended starting with the production of seed of the maize hybrid variety BH-540.

### Overview of the enterprise

The objective of the small-scale seed enterprise is to supply seed of improved varieties, to increase farmers' income through seed production, to improve the livelihood of the farmers and thereby to contribute to food security at the house level. The seed production activities within the Wamole irrigation cooperative involved 40 farmers and covered 20 ha. The cooperative's potential for seed production was estimated at 40 ha and 150 seed producing farmers. The cooperative has been legally established and licensed according to the rules and regulations of the country. It is led by a chairman and secretary elected from among the member farmers, and a clerk. The cooperative was basically established to produce high value crops such as vegetables using irrigation facilities.

### Production, marketing and financial plan

The enterprise was expected to produce 33 tons of maize hybrid seed of variety BH-540. A total area of 21 ha was obtained, involving 168 farmers with 0.5 ha of individual landholding in the production. 0.5 ton of basic seed was used for the total area; seed was obtained from the Bako Agricultural Research Centre with the costs of Birr 78,000 covered in cash. Assuming a processing loss of 10%, an estimated 30 tons of hybrid maize (BH-540) was expected to be sold in the year 2007 at a market price of Birr 8/kg of seed, which is equivalent to Birr 8000/ton (Table 6.18). It was planned to sell the product to the farmers in both the producing woreda (Shebedino) and the neighbouring woreda (Boricha), but the final price would depend on farmers' seed demands and market prices at the time of selling. If more than the expected yield was obtained, that surplus would be transported to Awassa and sold at the regional market.

**Table 6.18** Cost of seed production and expected income calculated for hybrid maize seed production by Wamole farmers' cooperative in Boricha woreda

| <i>Income</i>                       | <i>Total</i> |
|-------------------------------------|--------------|
| Sells volume (tons seeds sold)      | 30           |
| Average selling price per t of seed | 8,000        |
| Volume of sells                     | 240,000      |
| <i>Expenses</i>                     |              |
| Cost of basic seed                  | 78,000       |
| Processing costs                    | 12,000       |
| Seed dressing                       | 3,745        |
| Packaging (bags)                    | 4,800        |
| Total cost of seed produced         | 98,545       |
| Gross margin/profit                 | 141,455      |
| <i>Overheads</i>                    |              |
| Marketing costs                     | 2,000        |
| Total overheads                     | 2,000        |
| Total cost                          | 143,455      |
| Net profit                          | 96,545       |

Note: all amounts are in Birr.

It was planned to spend a total sum of Birr 143,455 on basic seed purchase, seed processing, seed dressing, packaging/bagging and marketing. The money was obtained from Sidama Development Agency as a loan from a revolving fund. Sales amounting to Birr 240,000 were expected (Table 6.18). It was expected that 44 farmers would increase their income by selling improved maize hybrid seed, and the seed shortages of about 240 farmers would be solved. A net income of 96,545 Birr was estimated for the enterprise (Table 6.18).

### **Constraints, challenges and opportunities**

The following constraints have been identified: land shortage and fragmented land holding, breeder seed shortage and high prices. Under field conditions, the basic seed of BH-540 has shown a decline in performance, typical for inbred lines. Consequently, farmers raised their fears for the success of the hybrid seed production enterprise within their cooperative. Efforts have been made to address the farmers' interest through the woreda structure. It is obvious that the performance of the male parent was poorer than that of the female parent. In some parts of the field, the growth of the male parent was retarded, plants being poorly established. Consequently synchronization between the male and female parents was difficult. However, with the consultative support of the ESE seed agronomists, the woreda, zone and regional BoARD agronomists did their best to improve the existing conditions by encouraging farmers to apply urea and carry out the required agronomic management practices. The woreda BoARD assigned an irrigation agronomist with a motorcycle to follow up the overall work. The stakeholders became very concerned about the success of the enterprise. The team tried to get support from the fund of the rural development capacity building programme to give the farmers further training in hybrid seed production. However, the nature of the chosen variety proved problematic. The team feared a pollen shortage, and their fears proved well-founded at the flowering stage. As a result, the entire exercise turned out to be a disappointment for the farmers, the cooperative, the stakeholders and the team. An important lesson to be learned is to initiate commercial seed production with a simple crop and only gradually move to more complex crops or even to hybrid seed production. One might even question whether hybrid maize seed production is a viable exercise on the scale of small-scale or community-based seed production. It is a complex matter, requiring several years of experience in seed production on the part of the farmers and support services involved.

Several opportunities can be identified on the basis of these experiences. The participatory seed system analysis and demand survey indicated a high seed demand at both local and regional level, suggesting opportunities for community-based and small-scale seed enterprises. Based on the limited availability and high demand, the price for hybrid maize seed is really high. For seed production in this region, it is favourable to work in those areas where irrigation facilities are available, as they allow for cultivation for seed production in the off season, offer sufficient areas for viable amounts of seed, and make it possible to isolate crops. Coupled with fertile land, this creates favourable conditions for seed production. Another plus over the past years has been the increasing grain price that leads farmers to look for quality seeds. A final

positive condition for the establishment of the seed enterprise in Boricha woreda is the close proximity to the woreda/regional market.

For successfully setting up a seed enterprise, the cooperative will require further technical backup and regular field monitoring, and access to market information. Since it is a cooperative, access to credit will not be complicated. Credit could be used to purchase inputs or threshing and processing machineries. Finally, the experience with hybrid maize seed production demonstrates the great need for training in seed production, processing and marketing.

Proposed follow-up activities, including regular follow-up by the research centre and BoARD experts, will define future and viable activities in seed production. The organizations, including the ESE, should provide further technical support on seed management, assist in the identification of existing and potential seed markets, and support the installation of small-scale processing machines.

Possible interventions of stakeholders such as NGOs, the regional agricultural and rural development bureaus, research institutes, universities, churches and local organizations acting in the region and woreda can obviously mitigate the seed shortage that farmers are currently facing. Policy changes might improve the current seed supply situation in the area, and in the region as a whole. Initiation of establishment of small-scale enterprises by individuals, farmer groups, cooperatives, private investors and/or social organizations has great potential to satisfy farmers' seed demands and contribute to the conservation of local/minor crops and varieties. However, the technology should not be the challenge, as happened with the BH-540 hybrid variety, leading to failure, as we have seen in the field. Even if a variety is in great demand, which was the basis for our selection of this variety, the challenge is to identify the right match between the technology, the capacity of the farmers and the enterprise, and the market demand.

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## **6.6 Felegeweni and Mekan community-based seed enterprises in Atsibi Womberta and Endamehoni districts, Tigray region\***

*Tadese Teweldebrhan, Beyene Dimitsu, Muez Teare and Woldehawariat Assefa*

Agricultural development remains the main strategy for improving the wellbeing of the majority of people in the Tigray region, northern Ethiopia. In Ethiopia in general, and in the Tigray region in particular, seed security underpins food security. According

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\* This section is an output of the Tigray regional team participating in the ESE/WUR/ICARDA Tailor-Made Training Programme on Revitalizing the farmer-based seed production and supporting informal seed supply of local crops in Ethiopia, supported by Nuffic (The Netherlands).

to the Bureau of Agriculture and Rural Development (BoARD), of the total cultivated land of 1.04 million ha, only 150,000 to 200,000 ha (15-20%) is estimated to be covered by improved varieties. The formal seed sector plays a role, especially in more accessible areas and for crops mainly distributed by the Ethiopian Seed Enterprise (ESE).

While more than 20 field crops and many local landraces are grown by farmers, improved varieties that are adapted to the agro-ecologic conditions of the region, and are distributed by the formal sector, are available for only a few crops such as wheat, teff, sorghum, field pea and lentil. Despite strong demand, there is a shortage of seed of even this limited number of varieties. The ESE and the BoARD are the main formal sector sources of for improved varieties where seeds are produced on farmers' fields on a contract basis, or brought from other parts of the country for local distribution. This incurs financial losses and entails logistic, administrative, and other associated problems. The major stakeholders in the formal seed system are Tigray Agricultural Research Institute (TARI), Mekelle University, the ESE, the BoARD and NGOs, which assist the formal/informal seed system or directly distribute seed themselves. Rest, Irish Aid, World Vision, IPMS/ILRI, Orthodox Church, Action Aid and Catholic Relief Services (CRS) are some of the NGOs involved in seed supply in the region.

The informal seed sector is predominant in the region and provides up to 80-85% of the seed produced annually for all crops. The share is expected to be higher if we include the exchange of improved seed through the informal seed system. The system is also responsible for the maintenance of genetic diversity, especially of major crops like barley, sorghum, wheat and teff. The informal seed system, although covering most of the seed demand, has its own major problems:

1. It is not properly linked to the formal seed sector so that farmers can get easy access to modern released varieties. The average yield of local wheat landraces is about 1.4 tons/ha, while a modern wheat variety yields 3 tons/ha. Similarly, legume yields could double from 0.8 to 1.6 tons/ha by using modern varieties.
2. Farmers do not differentiate between seed and grain during production. This results in problems associated with seed quality, such as seed-borne diseases, weed infestation, etc., which have a significant effect on productivity.

Seed experts representing the ESE-Mekele, the TARI, and the Tigray BoARD participated in the tailor-made training programme supporting informal seed supply in Ethiopia from October 2006 to October 2007. Upon initial training, the Tigray team conducted a participatory seed system analysis and seed demand survey in two districts in Tigray. This section focuses on the outcome of the participatory seed system analysis as conducted in November – December 2006, which forms a basis for the establishment of two community-based seed enterprises (CBSEs) in Atsibi Womberta and Endamehoni districts.

### **The seed supply situation in Atsibi Womberta and Endamehoni districts**

In the first study area, Atsibi Womberta district (Felegeweini Peasant Association) the informal seed system is dominant, and is indeed the only seed source for barley – a staple food crop used for the preparation of different traditional dishes in the district.

The informal seed system is therefore responsible for the maintenance of barley diversity in the study area. Similarly, the informal system is important for the maintenance and sustainable use of other food crops such as wheat, faba bean, lentil, field pea, potato, and other minor crops. The formal seed system is also active to a very limited extent. The only crop handled by the formal system is wheat (a major crop after barley), and only two varieties are distributed, while more than ten wheat local land races are cultivated in the study area. In the 2003/04 and 2004/05 cropping seasons, the ESE worked with the BoARD on the on-farm seed multiplication of wheat and field pea. In addition some crop varieties such as faba bean, field pea, wheat and potato are being demonstrated by Mekelle Research Centre.

In the second study area, Endamehoni district (Mekan Peasant Association) both the informal and formal seed systems are functional. The formal seed system is dominant for crops like wheat, field pea and faba bean, as the agro-ecology is highly suitable for these crops and high demand exists for seeds. The area has relatively dependable rainfall and the ESE and the OoARD (Office of Agricultural and Rural Development) have experience with farmer-based seed production, so that the site could serve as a seed source to the neighbouring woredas and region at large.

### **Overview of the enterprise**

The objective of the CBSE is to ensure improved availability of and access to seeds and varieties by farmers, and to enhance the performance of the informal sector in generating income and improving the livelihood of resource-poor farmers. In the Tigray region we have established two enterprises named Felegeweini Community-based Seed Enterprise and Mekan Community-based Seed Enterprise, which are located in the Atsibi Womberta district and Endamehoni districts, respectively. The Felegeweini CBSE has 35 member farmers and 5 ha irrigable land to produce potato, while the Mekan CBSE has 248 member farmers and 50 ha rain-fed land to produce wheat and field pea. The number of farmers and the area may increase over the years depending on the seed demand. The structure of both seed enterprises follows the legally established format for cooperatives.

### **Crops and varieties selected for the business**

From the results of the participatory seed analysis, we learnt the following about the Atsibi Womberta district (Felegeweini PA):

- The farming system in the study area is based on cereal production (barley);
- With a few exceptions of wheat and legume varieties which are under demonstration, the formal seed system did not have much to offer in terms of good varieties of traditional crops (barley, wheat and legumes);
- Farmers at the woreda in general and the study site in particular have generations-old experience of producing and maintaining seed of their own varieties, hence there is little opportunity of making a profit by selling seeds of local varieties which are self-pollinated crops;
- Although Atsbi woreda is not a traditionally potato producing area, the TARI, the Holeta Agricultural Research Centre and the BoARD have identified the woreda

as one of the locations for potato seed production because of its agro-ecological suitability, and they started identifying varieties that are adapted to the locality.

From the participatory seed analysis, we learnt the following about the Endamehoni district (Mekan PA):

- The woreda has potential for crop production and huge demand for seed of improved varieties among farmers, and thus presents an opportunity for small-scale seed enterprises to engage themselves in seed production and marketing;
- Endamehoni has a suitable agro-ecology for wheat and field pea production, for which a high seed demand exists;
- Endamehoni could serve as a seed source to the neighbouring woredas and the region at large;
- The ESE and the OoARD do have experience of farmer-based seed production in this district.

In view of these facts, the study team decided to choose potato for the establishment of a CBSE in the Atsibi Womberta district (Felegeweini PA), and wheat and field pea in Endamehoni district (Mekan PA). For potato, the programme included the Tolcha and Jalení varieties, which give high yields and are preferred by farmers in the study area. For wheat varieties, HAR-2501 and Tegegnech were selected on the basis of farmers' preferences because of the following characteristics: specific adaptation, high yield, earliness and high market price.

#### **Seed production, marketing and financial plans**

To design a realistic and accurate marketing plan we have gathered information from all possible sources available in the study areas and neighbouring districts. We prepared questionnaires for seed producers, potential seed buyers, and the OoARD of six districts. Professionals from World Vision/Ethiopia, IPMS/ILRI, and the millennium development goal project were also interviewed. For both seed enterprises, Felegeweini and Mekan, the production plan was prepared for five years.

Based on the seed production plan, 817 tons of potato, 1,666 tons of wheat, 553 tons of field pea, i.e. a total 3036 tons of raw seed will be produced in the project period (Table 6.19). Based on the marketing plan, 735 tons of potato, 1500 tons of wheat and 500 tons of field pea, i.e. a total 2735 tons of cleaned seed, will be sold to customers at a price with minimum profit margins in both seed enterprises (Table 6.19).

**Table 6.19** Estimated seed production and estimated seed sales (tons/year) of the Felegeweini and the Mekan community-based seed enterprise

| <i>Felegeweini CBSE</i>        | <i>2007</i> | <i>2008</i> | <i>2009</i> | <i>2010</i> | <i>2011</i> | <i>Total</i> |
|--------------------------------|-------------|-------------|-------------|-------------|-------------|--------------|
| Potato seed production         | 50          | 100         | 167         | 222         | 278         | 817          |
| Potato seed sales <sup>1</sup> | 45          | 90          | 150         | 200         | 250         | 735          |
| <i>Mekan CBSE</i>              |             |             |             |             |             |              |
| Wheat seed production          | 222         | 278         | 333         | 389         | 444         | 1666         |
| Field pea seed production      |             | 66          | 110         | 155         | 222         | 553          |
| Wheat seed sales <sup>2</sup>  | 200         | 250         | 300         | 350         | 400         | 1500         |
| Field pea seed sales           |             | 60          | 100         | 140         | 200         | 500          |

Notes: <sup>1</sup> Selling price of 4.00 Birr/kg; <sup>2</sup> Selling price of 3.25 Birr/kg.

The financial plans of both seed enterprises are based on the production plan and marketing plan, taking into consideration future needs for operation and expansion, the amount of seed sold and the selling prices. These are determined in such a way as to generate the income and profit required for the company to stay in business. See the details in Table 6.20.

**Table 6.20** Income and expense budget for Felegeweini and the Mekan community-based seed enterprise for 2007

|  | <i>Felegeweini CBSE<br/>Potato</i> | <i>Mekan CBSE<br/>Wheat</i> |
|--|------------------------------------|-----------------------------|
| <i>Income</i>                          |                                    |                             |
| Sales volume (t basic seed)            | 45                                 | 200                         |
| Average selling price/t seed           | 4,000                              | 3,250                       |
| Value of sales                         | 180,000                            | 650,000                     |
| Cost of basic seed                     | 20,000                             | 39,000                      |
| Processing costs                       |                                    | 52,000                      |
| Packaging (bags)                       | 15,000                             | 4,000                       |
| Labour                                 | 3,150                              | 84,000                      |
| Total cost of seed produced            | 38,150                             | 179,000                     |
| Gross margin profit                    | 141,850                            | 471,000                     |
| <i>Overhead costs</i>                  |                                    |                             |
| Staff (inspectors)                     | 2,602                              | 9,398                       |
| Administration costs                   | 651                                | 2,349                       |
| Total overhead costs                   | 3,253                              | 11,747                      |
| <i>Net profit</i>                      | <i>138,597</i>                     | <i>459,253</i>              |
| <i>Gross margin per t of seed sold</i> | <i>3,152</i>                       | <i>2,355</i>                |
| <i>Net profit per t of seed sold</i>   | <i>3080</i>                        | <i>2296</i>                 |

### Constraints and opportunities

*Constraints* that have been identified in the implementation of the CBSE are:

- Lack of knowledge and awareness among farmers on seed production and marketing; farmers do not make special arrangements in terms of land selection,

isolation or the various agronomic practices for seed production. Generally farmers practice plant (mass) selection at the time of maturity just before harvesting. Awareness-raising and training in seed production and marketing is needed;

- A basic seed supply that is inadequate for initiating farmer-based seed production and marketing;
- Land fragmentation and small landholdings, which make it difficult to keep the required isolation distances and cluster the plots;
- The fragile and high risk environment because of erratic rain and recurrent drought;
- Poor infrastructure.

*Opportunities* that have been identified in the implementation of the CBSE are:

- The presence of high seed demand for potato, wheat and field pea: selected sites could serve as a seed source to the neighbouring woredas and the region at large;
- The presences of strong national and regional initiatives in seed production;
- Willingness and commitment among stakeholders;
- The presence of development agents at kebele level and a cooperative division at district level;
- The presence of irrigation facilities for seed production: there is more than 1800 ha of irrigated land, of which more than 300 ha of land is covered by potato every year.

#### **Essential support and proposed follow-up activities**

Seed producer groups have to be organized in appropriate legal forms depending on the localities and commodities to be handled. Assistance and support needs to be provided to the CBSEs that will be established at pilot areas and then scaled-up to the regional level. The assistance required includes:

- Credit and input provision to make available pre-basic/basic seed and all inputs for seed production;
- Credit facilities for seed, using farmers to purchase inputs for grain production;
- Market promotion and information exchange, by assessing the seed market and creating market linkages;
- The provision of critical infrastructure;
- The provision of technical support.